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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/854,759	05/14/2001	Michael B. Ball	4589US (99-1151)	8899

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EXAMINER

HARAN, JOHN T

ART UNIT

PAPER NUMBER

1733

DATE MAILED: 08/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application N . 09/854,759	Applicant(s) <i>BM</i> BALL ET AL.	
	Examiner John T. Haran	Art Unit 1733	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 June 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-75 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-75 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                             | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6/18/03 has been entered.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-75 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims are indefinite in light of Applicant's arguments filed on 6/5/03. It is unclear what is meant by "the surface of the wafer" and "the front surface of the wafer" in regards to whether or not the bumps are considered part of the surface of the wafer. Applicant argues that the bumps are not part of the surface and that if the adhesive tape is only attached to the bumps then it is not attached to the surface of the wafer. Throughout the prosecution of this application, Examiner has interpreted the bumps to be part of the "surface of the wafer" and the "front surface of the wafer" and that the step of applying/attaching the adhesive tape to the surface (or front surface) of the wafer

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entailed applying the tape so that the adhesive tape is attached to the bumps and overlies portions of the wafer that do not have bumps. Examiner's interpretation is supported by and is consistent with the original specification particularly, paragraph 0010 which states "the wafer includes a front surface and a back surface, the front surface **including** conductive bumps", paragraph 0031 which states "the adhesive tape is adhesively placed and attached to the conductive bumps to overlie the front surface of the wafer", and Figure 4 which clearly illustrates that the adhesive tape is only attached to the bumps and not the wafer. Original claim 33, also provides support for Examiner's interpretation, claiming "applying an adhesive having a backing on to a portion **of said bumps of said front surface of said wafer**". Applicant points to original claim 45 for support of Applicant's interpretation that the surface of the wafer does not include the bumps which claims, "applying an adhesive having a backing to at least a portion of said bumps and at least a portion of said surface of said wafer". However, claim 45 appears to be inconsistent with the teachings of the specification taken as a whole.

It is noted that the Examiner is treating the "surface of the wafer" and "the front surface of the wafer" to include the bumps. Accordingly claims 33 and 45 appear to be indefinite by requiring the adhesive to attach to the bumps and the surface of the wafer, which is redundant since the bumps are part of the surface. It is suggested to amend the applying step of claim 33 to read - - applying an adhesive having a backing onto at least a portion of said bumps- - and to amend the applying step of claim 45 to read - - applying an adhesive having a backing to at least a portion of said bumps - -. As claims

33 and 45 now read they appear to require the adhesive to touch the "actual" surface of the wafer which is inconsistent with the teachings of the specification as a whole.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-6, 10-17, 21-27, 31-37, 41-49, 51-55, 57-64, and 66-73 are rejected under 35 U.S.C. 103(a) as being unpatentable over Satoh (U.S. Patent 6,338,980) in view of Bennett et al (U.S. Patent 6,478,918).

As noted above the bumps are considered part of the surface (or front surface) of the wafer.

Satoh discloses a method for manufacturing chip-scale packages and IC chips wherein a wafer is provided with bumps (projecting electrodes) on an active surface of the wafer, the adhering face of an adhesive member, such as a tape, is applied to the active face of the wafer thereby covering and protecting the bumps and the other face is attached to a table (wafer mount) by vacuum attraction (suction), and then the inactive face of the wafer is thinned through grinding (See abstract; Column 3, lines 27-50; and Column 6, lines 10-17). Also as illustrated in Figure 1C the adhesive face of the adhesive member conforms to the shape of the bumps and the nonadhesive face (backing) is a substantially planar surface. Satoh is silent towards the adhesive member having a backing.

Satoh discloses the adhesive member can have one adhesive face or two adhesive faces and can be a tape or a resin or rubber plate with an adhesive face (Column 10, lines 10-16). One skilled in the art would have readily realized that numerous possibilities exist for obtaining an adhesive member with one adhesive face and one nonadhesive face such as a nonadhesive film, resin plate, or rubber plate, that is rendered adhesive on one face while leaving the other face nonadhesive through heating or an adhesive film that is adhesive on both sides and is provided with a cover film or backing layer on one side to provide a nonadhesive side or providing a nonadhesive film with an adhesive coating on one side, all of which are well known and conventional methods for obtaining an adhesive member with one adhesive face and one nonadhesive face. One skilled in the art would have readily appreciated that they are all alternate expedients that are all obvious one over the other. Furthermore, it is notoriously well known and conventional that adhesive tapes have a backing, as shown for example in Bennett et al. Bennett et al is cited as an example of a conventional adhesive tape with a backing used in wafer grinding (See abstract). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide an adhesive tape that has a backing, as is notoriously well known and conventional in the method of Satoh.

Regarding claim 12, one skilled in the art would have readily appreciated that it is well known and conventional when providing a backing to an adhesive member that either the adhesive is applied to an object first and then the backing is applied or the adhesive is applied to the backing and then the adhesive is applied to an object. The

two are alternative expedients and are obvious one over the other. It would have been obvious to one of ordinary skill in the art to provide the adhesive to the active surface of the wafer and then apply the backing in the method of Satoh.

Regarding claims 33 and 45, as noted above the bumps are considered part of the surface (front surface) of the wafer and since the adhesive of Satoh is applied to the bumps it meets the limitations of claim 33 and 45.

Regarding claims 11, 22, and 32, while Satoh teaches thinning through grinding, it is also well known and conventional to thin through chemical-mechanical polishing. It would have been obvious to thin the wafer using the well known and conventional technique of chemical-mechanical polishing in the method of Satoh, as modified above.

6. Claims 7-9, 18-20, 28-30, 38-40, 50, 56, 65, and 74-75 are rejected under 35 U.S.C. 103(a) as being unpatentable over Satoh (U.S. Patent 6,338,980) in view of Bennett et al (U.S. Patent 6,478,918) as applied above, and further in view of the admitted prior art.

Satoh is silent towards the thickness of the wafer pre and post thinning, but does teach thinning the wafer 100 micrometers (about 4 mil) as an example (Column 8, lines 12-13).

The admitted prior art teaches that a wafer must be at least 12 mils thick to undergo the bumping process without damaging the wafer (Specification, page 3, paragraph 5).

One skilled in the art would have readily appreciated performing the bumping process to the wafer at the lowest permissible wafer thickness to minimize the amount of wafer material that needs to be thinned and thinning the wafer to the ultimate desired thickness. The ultimate thickness of the wafer is within the purview of one skilled in the art and as taught in both the admitted prior art and Satoh it is desired to minimize the size of the wafer thickness. It would have been obvious to one of ordinary skill in the art at the time the invention was made to bump the wafer surface when it has a thickness of at least 12 mil and to thin it to at least 6 mils in the method of Satoh, as modified above.

#### ***Response to Arguments***

7. Applicant's arguments filed 6/5/03 have been fully considered but they are not persuasive.

As noted above in paragraph 3, Applicant's position that the bumps are not part of the surface of the wafer has no support in the specification and is inconsistent with the teachings of the specification.

#### ***Conclusion***

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **John T. Haran** whose telephone number is **(703) 305-0052**. The examiner can normally be reached on M-Th (8 - 5) and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael W. Ball can be reached on (703) 308-2058. The fax phone numbers for the organization where this application or proceeding is assigned are (703)



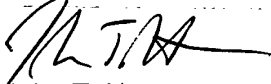
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872-9310 for regular communications and (703) 872-9311 for After Final  
communications.

Any inquiry of a general nature or relating to the status of this application or  
proceeding should be directed to the receptionist whose telephone number is (703) 308-

0661

  
John T. Haran

August 9, 2003

  
Michael W. Ball  
Supervisory Patent Examiner  
Technology Center 1700